

CLAIMS

What is claimed is:

1. A method of executing a native method in a Java virtual machine comprising:
 - 5 determining whether a native method is to be handled by a first native interface or one of a plurality of other native interfaces;
if the method is to be handled by the first native interface, invoking the method and enabling the method to access an internal state of the Java virtual machine;
 - 10 executing the method in the Java virtual machine; and
adjusting the state of the Java virtual machine based on execution of the method whereby transition between an interpreter loop and the native method via the first native interface is minimized.
- 15 2. A method as recited in claim 1 further comprising classifying one or more native methods so that the one or more native methods qualify for being handled by the first native interface.
3. A method as in claim 1 further comprising:
 - 20 eliminating a need to push a Java stack frame onto a Java stack;
eliminating a need to marshal one or more arguments and a method result from the Java stack to a C stack;
eliminating a need to marshal the method result from the C stack to the Java stack; and
 - 25 eliminating a need to pop the Java stack frame from the Java stack.
4. A method as recited in claim 1 wherein determining whether a native method is to be handled by a first native interface or one of a plurality of other native interfaces further comprises examining a method block of the native
30 method to determine a method type.
5. A method as recited in claim 1 further comprising:
obtaining a function pointer from a method block;
invoking the native method function; and

passing to the native method function one or more arguments that allow access to a Java virtual machine state to be used by the native method without making callbacks to the Java virtual machine.

- 5 6. A method as recited in claim 5 further comprising:
passing to the native method a pointer to arguments on a Java stack;
and
passing to the native method a pointer to a method block pointer, such
that a new method block pointer can be returned to the interpreter loop.

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7. A method as recited in claim 1 wherein executing the method in an
interpreter loop further comprises:
pushing a transition frame corresponding to a particular method onto a
first stack in the Java virtual machine;
15 the native method pushing a plurality of arguments associated with the
transition frame onto the first stack; and
returning a result code to the interpreter loop.

8. A method as recited in claim 7 wherein the first stack is a Java stack
and the result code indicates that a new transition frame has been pushed on
the Java stack.

9. A method as recited in claim 1 wherein adjusting the state of the JVM
further comprises:
25 storing a result from the native method on a Java stack; and
modifying a Java stack pointer based on a return code.

10. A method as recited in claim 1 wherein stack recursion in the Java
virtual machine is minimized and memory utilized by at least one stack is
30 reduced while the Java virtual machine is executing.

11. A system for executing a native method in a Java virtual machine,
comprising:
a processor; and
35 a computer-readable medium storing a program for execution by the
processor, the program comprising:

computer code that determines whether a native method is to be handled by a first native interface or one of a plurality of other native interfaces;

5 computer code that invokes the method and enables the method to access a state of the Java virtual machine, if the method is to be handled by the first native interface; and

computer code that executes the method in the Java Virtual Machine; and

10 computer code that adjusts the state of the Java Virtual Machine based on execution of the method whereby transition between an interpreter loop and the native method via the first native interface is minimized.

12. A computer-readable medium containing programmed instructions arranged to execute a native method in a Java virtual machine, the computer-
15 readable medium including programmed instructions for:

determining whether a native method is to be handled by a first native interface or one of a plurality of other native interfaces;

if the method is to be handled by the first native interface, invoking the method and enabling the method to access a state of the Java virtual machine;

20 executing the method in the Java Virtual Machine; and
adjusting the state of the JVM based on execution of the method whereby transition between an interpreter loop and the native method via the first native interface is minimized.